Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

      1.   (Currently Amended)   A method of splitting an image block with an image block splitting apparatus, comprising:

      setting a plurality of splitting threshold values with a macro block splitting determining unit of the image block splitting apparatus to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks with the macro block splitting determining unit by determining whether the macro block at a same location in a preceding image frame has been split; and

      setting a plurality of other splitting threshold values with a sub block splitting determining unit of the image block splitting apparatus to compare with a characteristic of each sub block and determining thereby whether to split each sub block into smaller sub blocks.

      2.   (Canceled)

      3.   (Previously Presented)   The method of claim 1, wherein the determining of whether to split each sub block into smaller sub blocks is performed by determining whether the sub block at a same location in a preceding image frame has been split.

      4.   (Previously Presented)   The method of claim 1, wherein the determining of whether to split the macro block into sub blocks comprises:

      determining a possibility of splitting the macro block by determining whether a ratio of maximum mean absolute difference (MAD) to minimum MAD of a sub block in the macro block is greater than a threshold value from among the set splitting threshold values for determining the possibility of splitting the macro block; and

      determining whether to split the macro block by comparing the threshold value for determining the possibility of splitting the macro block, the ratio of maximum MAD to minimum

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MAD, and a threshold value for determining whether to split the macro block with one another, if the ratio of maximum MAD to minimum MAD is greater than the threshold value for determining the possibility of splitting the macro block.

5.   (Canceled)

6.   (Previously Presented)   The method of claim 1, wherein the determining of whether to split each sub block into smaller sub blocks comprises:
determining a possibility of splitting the sub block by determining whether a ratio of maximum MAD to minimum MAD of the smaller sub block is greater than a threshold value from among the other set splitting threshold values for determining the possibility of splitting the sub block; and
determining whether to split the sub block by determining whether the ratio of maximum MAD to minimum MAD is greater than the threshold value for determining the possibility of splitting the sub block.

7.   (Previously Presented)   The method of claim 3, wherein the determining of whether to split each sub block into smaller sub blocks comprises:
determining a possibility of splitting the sub block by determining whether a ratio of maximum MAD to minimum MAD of the smaller sub block is greater than a threshold value from among the set other splitting threshold values for determining the possibility of splitting the sub block; and
determining whether to split the sub block by determining whether the ratio of maximum MAD to minimum MAD is greater than the threshold value for determining the possibility of splitting the sub block.

8.   (Previously Presented)   The method of claim 4, wherein the determining of whether to split the macro block comprises:
determining whether the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the macro block and another threshold

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value from among the set splitting threshold values for determining whether to split the macro block;

determining whether the macro block at the same location in the preceding image frame has been split if the ratio is between the threshold value and the other threshold value; and

determining not to split the macro block if the macro block at the same location in the preceding image frame has not been split, and determining to split the macro block if the macro block at the same location in the preceding image frame has been split and the ratio is between the threshold value and the other threshold value.

9.   (Previously Presented)   The method of claim 6, wherein the determining of whether to split the sub block comprises:

determining whether the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the sub block and another threshold value from among the other set splitting threshold values for determining whether to split the sub block;

determining whether the sub block at the same location in the preceding image frame has been split if the ratio is between the threshold value and the other threshold value; and

determining not to split the sub block if the sub block at the same location in the preceding image frame has not been split, and determining to split the sub block if the sub block at the same location in the preceding image frame has been split and the ratio is between the threshold value and the other threshold value.

10.   (Original) The method of claim 1, wherein the image frame is a binocular image frame representing a three dimensional image.

11 – 12 (Canceled).

13.   (Previously Presented)   The method of claim 1, further comprising:

splitting the macro block according to the determining by comparison with the thresholds and the other thresholds whether to split the macro block into sub blocks and into smaller sub

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blocks using quadtree disparity estimation.

14 – 15 (Canceled).

16.   (Currently Amended)   A method of splitting an image block with an image block splitting apparatus, comprising:

setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block by determining whether a macro block at a same location in a preceding image frame has been split with a macro block splitting determining unit of the image block splitting apparatus; and

setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks by determining whether a sub block at a same location in the preceding image frame has been split with a sub block splitting determining unit of the image block splitting apparatus.

17.   (Previously Presented)   The method of claim 16, wherein the determining whether to split the macro block by determining whether the macro block has been split in a preceding image frame at the same location comprises:

determining a possibility of splitting the macro block by determining whether a ratio of maximum mean absolute difference (MAD) to minimum MAD of a sub block in the macro block is greater than a threshold value from among the set macro block splitting threshold values for determining the possibility of splitting the macro block;

determining whether the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the macro block and another threshold value from among the set macro block splitting threshold values for determining whether to split the macro block;

determining whether the macro block at the same location in the preceding image frame has been split if the ratio is between the threshold value and the other threshold value; and

determining not to split the macro block if the macro block at the same location in the preceding image frame has not been split, and determining to split the macro block if the macro

block at the same location in the preceding image block has been split and the ratio is between the threshold value and the other threshold value.

18.   (Previously Presented)   The method of claim 16, wherein determining of whether to split the sub block into smaller sub blocks by determining whether the sub block has been split in a preceding image frame at the same location comprises:

determining a possibility of splitting the sub block by determining whether a ratio of maximum MAD to minimum MAD of the smaller sub block is greater than a threshold value from among the set sub block splitting threshold values for determining the possibility of splitting the sub block;

determining whether the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the sub block and another threshold value from among the set sub block splitting threshold values for determining whether to split the sub block;

determining whether the sub block at the same location in the preceding image frame has been split if the ratio is between the threshold value and the other threshold value; and

determining not to split the sub block if the sub block at the same location in the preceding image frame has not been split, and determining to split the sub block if the sub block at the same location in the preceding image frame has been split.

19.   (Original) The method claim 16, wherein the image frame is a binocular image frame representing a three dimensional image.

20 – 21 (Canceled).

22.   (Previously Presented)   The method of claim 16 further comprising:

splitting the macro block according to the determining of whether the macro block and sub blocks at respective same locations in the preceding image frame have been split using quadtree disparity estimation.

23 – 24 (Canceled).

25.   (Previously Presented)   A computer-readable medium having computer-readable codes recorded thereon that, when executed by a computer, perform a method of splitting an image block, the method comprising:

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks by determining whether the macro block at a same location in a preceding image frame has been split; and

setting a plurality of other splitting threshold values to compare with a characteristic of each sub block and determining thereby whether to split each sub block into smaller sub blocks.

26.   (Previously Presented)   A computer-readable medium having computer-readable codes recorded thereon, that, when executed by a computer, perform a method of splitting an image block, the method comprising:

setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split; and

setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks by determining whether the sub block at a same location in the preceding image frame has been split.

27.   (Previously Presented)   An apparatus to split an image block, comprising:

a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines therewith whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split; and

a sub block splitting determining unit that sets a plurality of sub block splitting threshold values for splitting each sub block into smaller sub blocks and determines therewith whether to

split the sub block.

28.   (Previously Presented)   The apparatus of claim 27, wherein the macro block splitting determining unit determines whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split.

29.   (Previously Presented)   The apparatus of claim 27, wherein the sub block splitting determining unit determines whether to split the sub block by determining whether the sub block at a same location in a preceding image frame has been split.

30.   (Previously Presented)   The apparatus of claim 27, wherein the macro block splitting determining unit comprises:
        a macro block splitting possibility determining portion that determines whether the ratio of maximum mean absolute difference (MAD) to minimum MAD of a sub block in the macro block is greater than a threshold value from among the macro block splitting threshold values for determining the possibility of splitting the macro block; and
        a macro block splitting determining portion that, if the ratio of maximum MAD to minimum MAD is greater than the threshold value for determining the possibility of splitting the macro block, determines whether to split the macro block by comparing the threshold value for determining the possibility of splitting the macro block, the ratio of maximum MAD to minimum MAD, and a threshold value from among the macro block splitting threshold values for determining whether to split the macro block.

31.   (Canceled).

32.   (Previously Presented)   The apparatus of claim 27, wherein the sub block splitting determining unit comprises:
        a sub block splitting possibility determining portion that determines whether the ratio of maximum MAD to minimum MAD of the smaller sub block is greater than a threshold value from among the sub block splitting threshold values for determining the possibility of splitting the sub

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block; and

a sub block splitting determining portion that, if the ratio of maximum MAD to minimum MAD is greater than the threshold value for determining the possibility of splitting the sub block, determines whether to split the sub block by comparing the threshold value for determining the possibility of splitting the sub block, the ratio of maximum MAD to minimum MAD, and a threshold value from among the sub block splitting threshold values for determining whether to split the sub block.

33.   (Canceled).

34.   (Previously Presented)   The apparatus of claim 30, wherein the macro block splitting determining portion comprises:

a preceding macro block splitting determiner that determines whether the macro block at a same location in a preceding image frame has been split after determining that the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the macro block and the threshold value for determining whether to split the macro block; and

a macro block splitting final determiner that finally determines not to split the macro block if the macro block at the same location in the preceding image frame has not been split, and determines to split the macro block if the macro block at the same location in the preceding image frame has been split.

35.   (Previously Presented)   The apparatus of claim 32, wherein the sub block splitting determining portion comprises:

a preceding sub block splitting determiner that determines whether the sub block at a same location in a preceding image frame has been split after determining that the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the sub block and the threshold value for determining whether to split the sub block; and

a sub block splitting final determiner that finally determines not to split the sub block if

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the sub block at the same location in the preceding image frame has not been split, and determines to split the sub block if the sub block at the same location in the preceding image frame has been split.

36.   (Original) The apparatus of claim 27, wherein the image frame is a binocular image frame representing a three dimensional image.

37 – 38 (Canceled).

39.   (Previously Presented)   The apparatus of claim 27, wherein splitting of the macro block and the sub block is performed using quadtree disparity estimation.

40 – 41 (Canceled).

42.   (Previously Presented)   An apparatus to split an image block, which comprises:
        a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split; and
        a sub block splitting determining unit that sets a plurality of sub block splitting threshold values for splitting each sub block into smaller sub blocks and determines whether to split each sub block by determining whether the sub block at a same location in the preceding image frame has been split.

43.   (Previously Presented)   The apparatus of claim 42, wherein the macro block splitting determining unit comprises:
        a macro block splitting possibility determiner that determines whether a ratio of maximum mean absolute difference (MAD) to minimum MAD of the sub block in the macro block is greater than a threshold value from among the set macro block splitting threshold

values for determining the possibility of splitting the macro block;

a preceding macro block splitting determiner that determines whether the macro block at the same location in the preceding image frame has been split after determining that the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the macro block and a threshold value from among the set macro block splitting threshold values for determining whether to split the macro block; and

a macro block splitting final determiner that finally determines not to split the macro block if the macro block at the same location in the preceding image frame has not been split, and determines to split the macro block if the macro block at the same location in the preceding image frame has been split.

44.   (Previously Presented)   The apparatus of claim 42, wherein the sub block splitting determining unit comprises:

a sub block splitting possibility determiner that determines whether the ratio of maximum mean absolute difference (MAD) to minimum MAD of the smaller sub block in the sub block is greater than a threshold value from among the sub block splitting threshold values for determining the possibility of splitting the sub block;

a preceding sub block splitting determiner that determines whether the sub block at the same location in the preceding image frame has been split after determining that the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the sub block and a threshold value from among the sub block splitting threshold values for determining whether to split the sub block; and

a sub block splitting final determiner that finally determines not to split the sub block if the sub block at the same location in the preceding image frame has not been split, and determines to split the sub block if the sub block at the same location in the preceding image frame has been split.

45.   (Original)   The apparatus of claim 42, wherein the image frame is a binocular image frame representing a three dimensional image.

46 – 47 (Canceled).

48.   (Previously Presented)   The apparatus of claim 42, wherein splitting of the macro block and the sub block is performed using quadtree disparity estimation.

49 – 50   (Canceled).

51.   (Currently Amended)   A method of splitting an image block with an image block splitting apparatus, comprising:

splitting macro image blocks each of left-eye views and right eye views into sub image blocks according to quadtree disparity estimation using a plurality of splitting threshold values and determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split with a macro block splitting determining unit of the image block splitting apparatus; and

splitting each sub block into smaller sub blocks according to the quadtree disparity estimation using a plurality of other splitting threshold values with a sub block splitting determining unit of the image block splitting apparatus.

52.   (Previously Presented)   The recording medium of claim 25, the program coded method further comprising:

determining whether the sub block at a same location in a preceding image frame has been split.

53.   (Previously Presented)   The apparatus of claim 42, wherein the macro block splitting determining unit comprises:

a macro block splitting possibility determiner that whether the ratio of maximum mean absolute difference (MAD) to minimum MAD of the sub block in the macro block is greater than a threshold value from among the macro block splitting threshold values for determining the possibility of splitting the macro block.

54.   (Previously Presented)   The apparatus of claim 42, wherein the macro block splitting determining unit comprises:

a preceding macro block splitting determiner that determines whether the macro block at a same location in a preceding image frame has been split after determining that the ratio of maximum MAD to minimum MAD is between the threshold value for determining the possibility of splitting the macro block and a threshold value from among the macro block splitting threshold values for determining whether to split the macro block.

55.   (Previously Presented)   The apparatus of claim 54, wherein the macro block splitting determining unit comprises:

a macro block splitting final determiner that finally determines not to split the macro block if the macro block at the same location in the preceding image frame has not been split, and determines to split the macro block if the macro block at the same location in the preceding image frame has been split.

56.   (Canceled)

57.   (Previously Presented)   The method of splitting an image block of claim 51, further comprising:

determining not to split the sub block if the sub block at a same location in a preceding image frame has not been split